

**GSFC JPSS CMO
October 11, 2016
Released**

Effective Date: September 22, 2016
Block/Revision 0200D

Joint Polar Satellite System (JPSS) Ground Project

Code 474

474-00448-01-14-B0200

**Joint Polar Satellite System (JPSS)
Algorithm Specification Volume I:
Software Requirement Specification
(SRS) for the Cloud Optical Properties**

Block 2.0.0



National Aeronautics and
Space Administration

**Goddard Space Flight Center
Greenbelt, Maryland**

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for the Cloud Optical Properties JPSS Review/Approval Page

Prepared By:

JPSS Ground System
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)

Approved By:

Robert M. Morgenstern	Date
JPSS Ground Project Mission Systems Engineering Manager	
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)	

Approved By:

Daniel S. DeVito	Date
JPSS Ground Project Manager	
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)	

**Goddard Space Flight Center
Greenbelt, Maryland**

Preface

This document is under JPSS Ground Project configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

JPSS Configuration Management Office
NASA/GSFC
Code 474
Greenbelt, MD 20771

Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev-	Aug. 29, 2013	This version incorporates 474-CCR-13-1195 which was approved by JPSS Ground ERB on the effective date shown.
A	Feb 12, 2014	This version incorporates 474-CCR-13-1195 which was approved by JPSS Ground ERB on the effective date shown.
A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.
B	Dec 05, 2014	This version incorporates 474-CCR-14-1721, 474-CCR-14-1741, 474-CCR-14-178, 474-CCR-14-2110 and 474-CCR-14-2131 which was approved by JPSS Ground ERB on the effective date shown.
C	Mar 29, 2016	This version incorporates 474-CCR-15-2452, 474-CCR-15-2480, 474-CCR-15-2657, and 474-CCR-16-2817 which was approved by JPSS Ground ERB on the effective date shown.
0200D	Sep 22, 2016	This version incorporates 474-CCR-16-2939 and 474-CCR-16-3049 which was approved by JPSS Ground ERB on the effective date shown.

Table of TBDs/TBRs

TBx	Type	ID	Text	Action
None				

Table of Contents

1	Introduction.....	1
1.1	Identification	2
1.2	Algorithm Overview	2
1.3	Document Overview	2
2	Related Documentation.....	3
2.1	Parent Documents	3
2.2	Applicable Documents.....	3
2.3	Information Documents	3
3	Algorithm Requirements.....	5
3.1	States and Modes	5
3.1.1	Normal Mode Performance.....	5
3.1.2	Graceful Degradation Mode Performance	5
3.2	Algorithm Functional Requirements.....	5
3.2.1	Product Production Requirements	5
3.2.2	Algorithm Science Requirements	5
3.2.3	Algorithm Exception Handling.....	6
3.3	External Interfaces	6
3.3.1	Inputs.....	6
3.3.2	Outputs	11
3.4	Science Standards	11
3.5	Metadata Output.....	11
3.6	Quality Flag Content Requirements.....	12
3.7	Data Quality Notification Requirements	12
3.8	Adaptation.....	12
3.9	Provenance Requirements.....	12
3.10	Computer Software Requirements.....	12
3.11	Software Quality Characteristics	12
3.12	Design and Implementation Constraints.....	12
3.13	Personnel Related Requirements	13
3.14	Training Requirements.....	13
3.15	Logistics Related requirements.....	13
3.16	Other Requirements	13
3.17	Packaging Requirements.....	13
3.18	Precedence and Criticality	13
Appendix A.	Requirements Attributes	14

List of Figures

Figure: 3-1 Cloud Optical Properties Data Flows.....	8
--	---

List of Tables

Table: 1-1 JPSS Ground System Services	2
Table: 3-1 Systems Resource Flow Matrix: Cloud Optical Properties.....	9

1 Introduction

The Joint Polar Satellite System (JPSS) is the National Oceanic and Atmospheric Administration's (NOAA) next-generation operational Earth observation program that acquires and distributes global environmental data primarily from multiple polar-orbiting satellites. The program plays a critical role in NOAA's mission to understand and predict changes in weather, climate, oceans and coasts, and the space environment, which support the Nation's economy and protect lives and property. The first JPSS satellite mission, the Suomi National Polar-orbiting Partnership (S-NPP) satellite, successfully launched in October 2011. S-NPP, along with the legacy NOAA Polar Operational Environmental Satellites (POES), provides continuous environmental observations. Two JPSS satellites will follow S-NPP: JPSS-1, planned for launch in fiscal year (FY) 2017, with JPSS-2 to follow in FY2021. In the future, the JPSS Polar Follow-On (PFO) provides for two additional missions, JPSS-3 and JPSS-4, as follow-on to the JPSS-2 mission to extend the JPSS Program lifecycle out to 2038.

In addition to the JPSS Program's own satellites operating in the 1330 (± 10) Local Time of the Ascending Node (LTAN) orbit, NOAA also leverages mission partner assets for complete global coverage. These partner assets include the Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP) operational weather satellites (in the 1730 - 1930 LTAN orbit), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (Metop) satellites (in the 2130 LTAN orbit) and the Japanese Aerospace Exploration Agency (JAXA) Global Change Observation Mission-Water (GCOM-W) satellite (in the 1330 LTAN orbit). JPSS routes Metop data from McMurdo Station, Antarctica to the EUMETSAT facility in Darmstadt, Germany and EUMETSAT, in turn, provides Metop data to NOAA. For GCOM, JPSS routes the GCOM-W data from Svalbard, Norway to the NOAA Satellite Operations Facility (NSOF) in Suitland, MD, processes GCOM-W data and delivers GCOM-W products to the JPSS users who have JAXA permissions.

Additionally, the JPSS Program provides data acquisition and routing support to the DMSP and the WindSat Coriolis Program. JPSS routes DMSP data from McMurdo Station to the 557th Weather Wing at Offutt Air Force Base in Omaha, NE. After processing, the 557th releases the DMSP data for public consumption over the Internet via the National Geophysical Data Center in Boulder, CO. The JPSS Program provides data routing support to the National Science Foundation (NSF), as well as the National Aeronautics and Space Administration (NASA) Space Communications and Navigation (SCaN)-supported missions, which include the Earth Observing System (EOS). As part of the agreements for the use of McMurdo Station, JPSS provides communications/network services for the NSF between McMurdo Station, Antarctica and Centennial, Colorado.

As a multi-mission ground infrastructure, the JPSS Ground System supports the heterogeneous constellation of the before-mentioned polar-orbiting satellites both within and outside the JPSS Program through a comprehensive set of services as listed in Table 1-1.

Table: 1-1 JPSS Ground System Services

Service	Description
Enterprise Management and Ground Operations	Provides mission management, mission operations, ground operations, contingency management and system sustainment
Flight Operations	Provides launch support and early orbit operations, telemetry and commanding, orbital operations, mission data playback, payload support, flight software upgrade, flight vehicle simulation, and disposal at the end of mission life
Data Acquisition	Provides space/ground communications for acquiring mission data
Data Routing	Provides routing of telemetry, mission and/or operations data through JPSS' global data network
Data Product Generation	Provides the processing of mission data to generate and distribute raw, sensor, environmental, and ancillary data products
Data Product Calibration and Validation	Provides calibration and validation of the data products
Field Terminal Support	Provides development and operational support to the Field Terminal customers

1.1 Identification

This SRS provides requirements for the Cloud Optical Properties Intermediate Products (IPs) which include VIIRS (Visible Infrared Imaging Radiometer Suite) Cloud Optical Properties IP and VIIRS Ice & Night Water Cloud Top Temperature IP.

1.2 Algorithm Overview

The algorithm retrieves Cloud Optical Properties IP which includes cloud optical thickness and effective particle size and VIIRS Ice & Night Water Cloud Top Temperature IP. Algorithm uses VIIRS brightness temperatures and reflectances for each cloudy VIIRS Moderate Resolution Pixel. The products are used as inputs to some cloud physical products calculation.

1.3 Document Overview

Section	Description
Section 1	Introduction - Provides a brief overview of the JPSS Ground System and the relevant algorithm, as reference material only.
Section 2	Related Documentation - Lists related documents and identifies them as Parent, Applicable, or Information Documents such as, MOAs, MOUs, technical implementation agreements, as well as Data Format specifications. This section also establishes an order of precedence in the event of conflict between two or more documents.
Section 3	Algorithm Requirements - Provides a summary of the science requirements for the products covered by this volume.
Appendix A	Requirements Attributes - Provides the mapping of requirements to verification methodology and attributes.

2 Related Documentation

The latest JPSS documents can be obtained from URL:

https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference document(s) is (are) the Parent Document(s) from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
470-00067	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
470-00067-02	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD), Volume 2 - Science Product Specification
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Algorithms

2.2 Applicable Documents

The following document(s) is (are) the Applicable Document(s) from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
D0001-M01-S01-013	JPSS Cloud Effective Particle Size and Cloud Optical Thickness Algorithm Theoretical Basis Document (ATBD)
474-00448-02-14	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Cloud Optical Properties
474-00448-04-14	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Software Parameter File (SRSPF) for the Cloud Optical Properties

2.3 Information Documents

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of this document.

Doc. No.	Document Title
474-00333	Joint Polar Satellite System (JPSS) Ground System (GS) Architecture Description Document (ADD)
474-00054	Joint Polar Satellite System (JPSS) Ground System (GS) Concept of Operations (ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon

Doc. No.	Document Title
474-00448-03-14	JPSS Algorithm Specification Volume III: Operational Algorithm Description (OAD) for the Cloud Optical Properties
429-05-02-42	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for NPP
472-00251	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for JPSS-1

3 Algorithm Requirements

3.1 States and Modes

3.1.1 Normal Mode Performance

SRS.01.14_485 The VIIRS Cloud Optical Properties IP algorithm shall calculate the pixel level cloud optical thickness Tau.

Rationale: The IP performance values are derived to maintain the compliance to the performance specifications of the downstream EDR products.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_486 The VIIRS Ice & Night Water Cloud Top Temperature IP algorithm shall calculate the pixel level VIIRS Ice & Night Water Cloud Top Temperature.

Rationale: The IP performance values are derived to maintain the compliance to the performance specifications of the downstream EDR products.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_520 The VIIRS Cloud Optical Properties IP algorithm shall calculate the pixel level cloud effective particle size.

Rationale: The IP performance values are derived to maintain the compliance to the performance specifications of the downstream EDR products.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.1.2 Graceful Degradation Mode Performance

SRS.01.14_487 The VIIRS Cloud Optical Properties software shall use NCEP extended forecast data for fallback processing when the relevant NCEP current forecast input is not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. The relevant NCEP forecasts are Atmospheric Temperature Profile, Atmospheric Moisture Profile, Surface Pressure and Surface Temperature at a VIIRS 750m granulation. These degraded products are not required to meet the algorithm performance requirements.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.2 Algorithm Functional Requirements

3.2.1 Product Production Requirements

3.2.2 Algorithm Science Requirements

SRS.01.14_490 The VIIRS Cloud Optical Properties IP software shall incorporate a computing algorithm provided for Cloud Optical Properties.

Rationale: The IP software through its computing algorithm must produce Cloud Optical Properties IP in accordance with the JPSS VIIRS Cloud Optical Properties ATBD (D0001-M01-S01-013).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_491 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall incorporate a computing algorithm provided for ice & night water cloud top temperature.

Rationale: The IP software through its computing algorithm must produce Cloud Optical Properties IP in accordance with the JPSS VIIRS Cloud Optical Properties ATBD (D0001-M01-S01-013).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.2.3 Algorithm Exception Handling

SRS.01.14_492 The VIIRS Cloud Optical Properties IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification for Cloud Optical Properties, Vol IV, SRSPF (474-00448-04-14) <CloudOptPropIP><fill>.

Rationale: The IP software through its computing algorithm must fill the Cloud Optical Properties IP values based on the established fill conditions to satisfy exclusion and fill conditions.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_493 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudTopTempIP><fill>.

Rationale: The IP software through its computing algorithm must fill the Cloud Optical Properties IP values based on the established fill conditions to satisfy exclusion and fill conditions.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.3 External Interfaces

3.3.1 Inputs

SRS.01.14_494 The VIIRS Cloud Optical Properties IP software shall incorporate inputs as specified in Table 3-1.

Rationale: The IP generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Cloud Optical Properties IP product.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_495 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall incorporate inputs as specified in Table 3-1.

Rationale: The IP generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Cloud Optical Properties IP product.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Table 3-1 and Figure 3-1 are best viewed together since they describe the processes governed by this SRS in different ways. The figure diagrams the data flowing into, out of, and within the code governed by this SRS. The table lists these same data interactions as well as all downstream dependencies for outputs from this SRS.

Each row in the table describes a single software interaction - data flowing from one software item to another. The data is listed in the first column. The second and third columns include the short name and mnemonic for the data. Blanks indicate there is no mnemonic. The fourth and fifth columns contain the SRS that generates the data product(s) in the first column, and the SRS that receives those products. The final two columns contain the actual function name in Algorithm Development Library (ADL) that produces those products, and the function that inputs those products. The SRS's titled "Ingest MSD" and "Store/Retrieve" are non-existent SRS's functioning as data handling for the IDPS. The software functions "Store Products" and "Retrieve Products" are similar non-existent functions that operate as IDPS data handling.

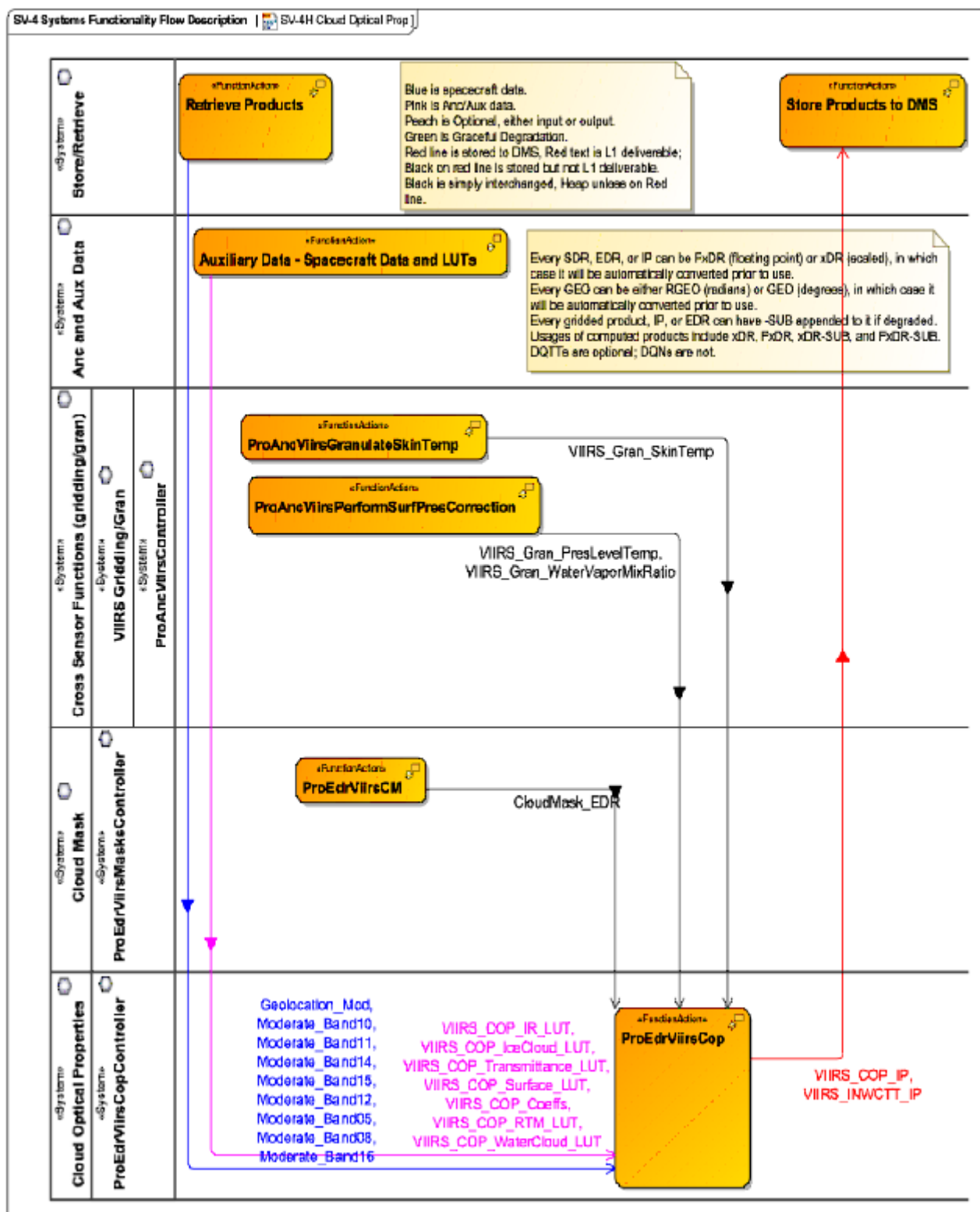


Figure: 3-1 Cloud Optical Properties Data Flows

Table: 3-1 Systems Resource Flow Matrix: Cloud Optical Properties

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
1	<ul style="list-style-type: none"> •Geolocation_Mod •Moderate_Band10 •Moderate_Band11 •Moderate_Band14 •Moderate_Band15 •Moderate_Band12 •Moderate_Band05 •Moderate_Band08 •Moderate_Band16 	<ul style="list-style-type: none"> •VIIRS-MOD-RGEO •VIIRS-M10-SDR •VIIRS-M11-SDR •VIIRS-M14-SDR •VIIRS-M15-SDR •VIIRS-M12-SDR •VIIRS-M5-SDR •VIIRS-M8-SDR •VIIRS-M16-SDR 	<ul style="list-style-type: none"> •None •SDRE-VM10-C0030 •SDRE-VM11-C0030 •SDRE-VM14-C0030 •SDRE-VM15-C0030 •SDRE-VM12-C0030 •SDRE-VM05-C0030 •SDRE-VM08-C0030 •SDRE-VM16-C0030 	Store/Retrieve (VIIRS SDR)	Cloud Optical Properties	Retrieve Products	ProEdrViirsCo p
2	<ul style="list-style-type: none"> •VIIRS_COP_IR_LUT •VIIRS_COP_IceCloud_LUT •VIIRS_COP_Transmittance_LUT •VIIRS_COP_Surface_LUT •VIIRS_COP_Coeffs •VIIRS_COP_RTM_LUT •VIIRS_COP_WaterCloud_LUT 	<ul style="list-style-type: none"> •VIIRS-COP-IRSPECTRAL-LUT •VIIRS-ICE-Cld-LUT •VIIRS-Cop-Transmittance-LUT •VIIRS-COP-Surface-LUT •VIIRS-COP-IP-AC •VIIRS-COP-RTM-LUT •VIIRS-Water-Cld-LUT 	<ul style="list-style-type: none"> •NP_NU-LM0233-088 •NP_NU-LM0040-002 •NP_NU-LM0040-017 •NP_NU-LM0233-063 •DP_NU-LM2020-015 •NP_NU-LM0233-089 •NP_NU-LM0040-003 	Anc and Aux Data	Cloud Optical Properties	Auxiliary Data - Spacecraft Data and LUTs	ProEdrViirsCo p
3	•VIIRS_Gran_SkinTemp	•VIIRS-ANC-Temp-Skin-Mod-Gran	•None	Grid Gran	Cloud Optical Properties	ProAncViirsGranulateSkinTemp	ProEdrViirsCo p

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
4	•VIIRS_Gran_PresLevelTemp •VIIRS_Gran_WaterVaporMixRatio	•VIIRS-ANC-Iso-Lev-Temp-Mod-Gran •VIIRS-ANC-Wtr-Vpr-Mix-Ratio-Lev-Mod-Gran	•None •None	Grid Gran	Cloud Optical Properties	ProAncViirsPerformSurfPresCorrection	ProEdrViirsComp
5	•CloudMask_EDR	•VIIRS-CM-EDR	•EDRE-CMIP-C0030	Cloud Mask	Cloud Optical Properties	ProEdrViirsCM	ProEdrViirsComp
6	•VIIRS_COP_IP	•VIIRS-Cd-Opt-Prop-IP	•IMPI_VCOP_R0100	Cloud Optical Properties	Cryosphere	ProEdrViirsComp	ProEdrViirsIceQual
7	•VIIRS_COP_IP	•VIIRS-Cd-Opt-Prop-IP	•IMPI_VCOP_R0100	Cloud Optical Properties	Snow Cover	ProEdrViirsComp	ProEdrViirsSnow
8	•VIIRS_COP_IP	•VIIRS-Cd-Opt-Prop-IP	•IMPI_VCOP_R0100	Cloud Optical Properties	Cloud Physical Properties	ProEdrViirsComp	ProEdrViirsPpc
9	•VIIRS_COP_IP •VIIRS_INWCTT_IP	•VIIRS-Cd-Opt-Prop-IP •VIIRS-INWCTT-IP	•IMPI_VCOP_R0100 •IMPI_VIWT_R0100	Cloud Optical Properties	Cloud Physical Properties	ProEdrViirsComp	ProEdrViirsCtp
10	•VIIRS_COP_IP •VIIRS_INWCTT_IP	•VIIRS-Cd-Opt-Prop-IP •VIIRS-INWCTT-IP	•IMPI_VCOP_R0100 •IMPI_VIWT_R0100	Cloud Optical Properties	Store/Retrieve	ProEdrViirsComp	Store Products to DMS

3.3.2 Outputs

SRS.01.14_521 The Cloud Optical Properties IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_496 The VIIRS Cloud Optical Properties IP software shall generate the VIIRS Cloud Optical Properties IP product in conformance with the XML format file in Attachment A.1 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_497 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall generate the VIIRS Ice & Night Water Cloud Top Temperature IP product in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_498 The VIIRS Cloud Optical Properties IP software shall use the geolocation for the VIIRS M-band.

Rationale: The product must be associated with the geolocation to meet the geolocation accuracy requirement.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_499 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall use the geolocation for the VIIRS M-band.

Rationale: The product must be associated with the geolocation to meet the geolocation accuracy requirement.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

SRS.01.14_500 The VIIRS Cloud Optical Properties IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudOptPropIP><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_501 The VIIRS Ice & Night Water Cloud Top Temperature IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudTopTempIP><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.7 Data Quality Notification Requirements

Not applicable.

3.8 Adaptation

Not applicable.

3.9 Provenance Requirements

Not applicable.

3.10 Computer Software Requirements

Not applicable.

3.11 Software Quality Characteristics

Not applicable.

3.12 Design and Implementation Constraints

SRS.01.14_502 The JPSS Common Ground System shall execute the VIIRS Cloud Optical Properties IP algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.14_503 The JPSS Common Ground System shall execute the VIIRS Ice & Night Water Cloud Top Temperature IP algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.13 Personnel Related Requirements

Not applicable.

3.14 Training Requirements

Not applicable.

3.15 Logistics Related requirements

Not applicable.

3.16 Other Requirements

Not applicable.

3.17 Packaging Requirements

Not applicable.

3.18 Precedence and Criticality

Not applicable.

Appendix A. Requirements Attributes

The Requirements Attributes Table lists each requirement with CM-controlled attributes including requirement type, mission effectivity, requirement allocation(s), block start and end, method(s) for verifying each requirement, etc.

Req ID	SRS 14 - Cloud Optical Properties	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
SRS.01.14_485	The VIIRS Cloud Optical Properties IP algorithm shall calculate the pixel level cloud optical thickness Tau.	P	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.14_486	The VIIRS Ice & Night Water Cloud Top Temperature IP algorithm shall calculate the pixel level VIIRS Ice & Night Water Cloud Top Temperature.	P	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.14_520	The VIIRS Cloud Optical Properties IP algorithm shall calculate the pixel level cloud effective particle size.	P	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.14_487	The VIIRS Cloud Optical Properties software shall use NCEP extended forecast data for fallback processing when the relevant NCEP current forecast input is not available.	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_490	The VIIRS Cloud Optical Properties IP software shall incorporate a computing algorithm provided for Cloud Optical Properties.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_491	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall incorporate a computing algorithm provided for ice & night water cloud top temperature.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_492	The VIIRS Cloud Optical Properties IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification for Cloud Optical Properties, Vol IV, SRSPF (474-00448-04-14) <CloudOptPropIP><fill>.	E	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_493	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall set	E	IP	S-NPP JPSS-1	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 14 - Cloud Optical Properties	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
	<FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudTopTempIP><fill>.			JPSS-2						
SRS.01.14_494	The VIIRS Cloud Optical Properties IP software shall incorporate inputs as specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_495	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall incorporate inputs as specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_521	The Cloud Optical Properties IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).	Ft	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_496	The VIIRS Cloud Optical Properties IP software shall generate the VIIRS Cloud Optical Properties IP product in conformance with the XML format file in Attachment A.1 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_497	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall generate the VIIRS Ice & Night Water Cloud Top Temperature IP product in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cloud Optical Properties (474-00448-02-14).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_498	The VIIRS Cloud Optical Properties IP software shall use the geolocation for the VIIRS M-band.	Fg	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 14 - Cloud Optical Properties	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
SRS.01.14_499	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall use the geolocation for the VIIRS M-band.	Fg	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_500	The VIIRS Cloud Optical Properties IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudOptPropIP><QF>.	Q	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_501	The VIIRS Ice & Night Water Cloud Top Temperature IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for Cloud Optical Properties (474-00448-04-14) <CloudTopTempIP><QF>.	Q	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_502	The JPSS Common Ground System shall execute the VIIRS Cloud Optical Properties IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.14_503	The JPSS Common Ground System shall execute the VIIRS Ice & Night Water Cloud Top Temperature IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA